

Apple Culture on the Midare Fan in the Yamagata Basin, Yamagata Prefecture

著者	Hasegawa Norio
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Norio HASEGAWA

1. Yamagata Basin

Yamagata Basin is a part of the so-called "median groove" which means a number of small fault basins arranged longitudinally from south to north on the western side of the Owu Mountains. The basin is drained by the Mogami River in its northern part, and its tributaries such as the Su River and the Shira River from south and the Sagae River from west join the main river. Along the eastern margin of the basin there are three alluvial fans, Mamigasaki, Tachiya and Midare, on which several rivers flow westward and also join the Mogami River.

The dominant agricultural land use of the basin floor is paddy field. However, these fans have long remained uncultivated, because they have poor soils and are deficient of irrigation facilities. Recently, greater part of the Mamigasaki fan is occupied by the city area of Yamagata and became the vegetable fields for the purpose of supplying the vegetables to urban people. The Tachiya fan and the Midare fan were used as mulberry fields and grass land, and considerable area has been changed to fruit-yards such as apples and grapes. On the gentle slopes of the Sagae fan in the western part of the basin, the land is mainly used as paddy field, and the flood plains of the Mogami River and the Su River is occupied by mulberry fields and vegetable

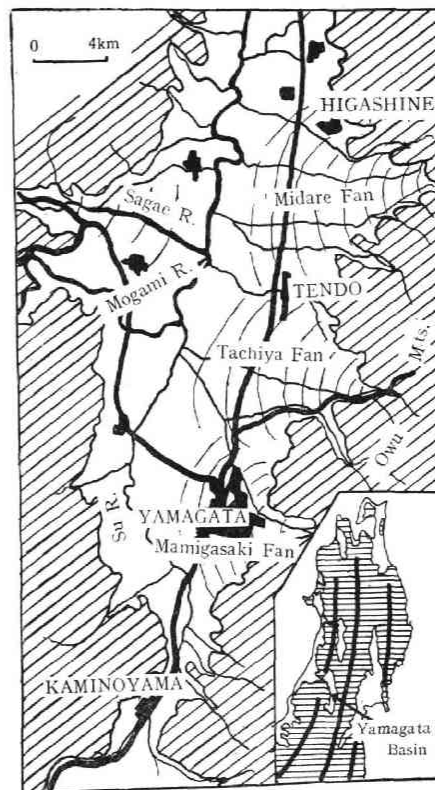


Fig. 1 Index map—Yamagata Basin

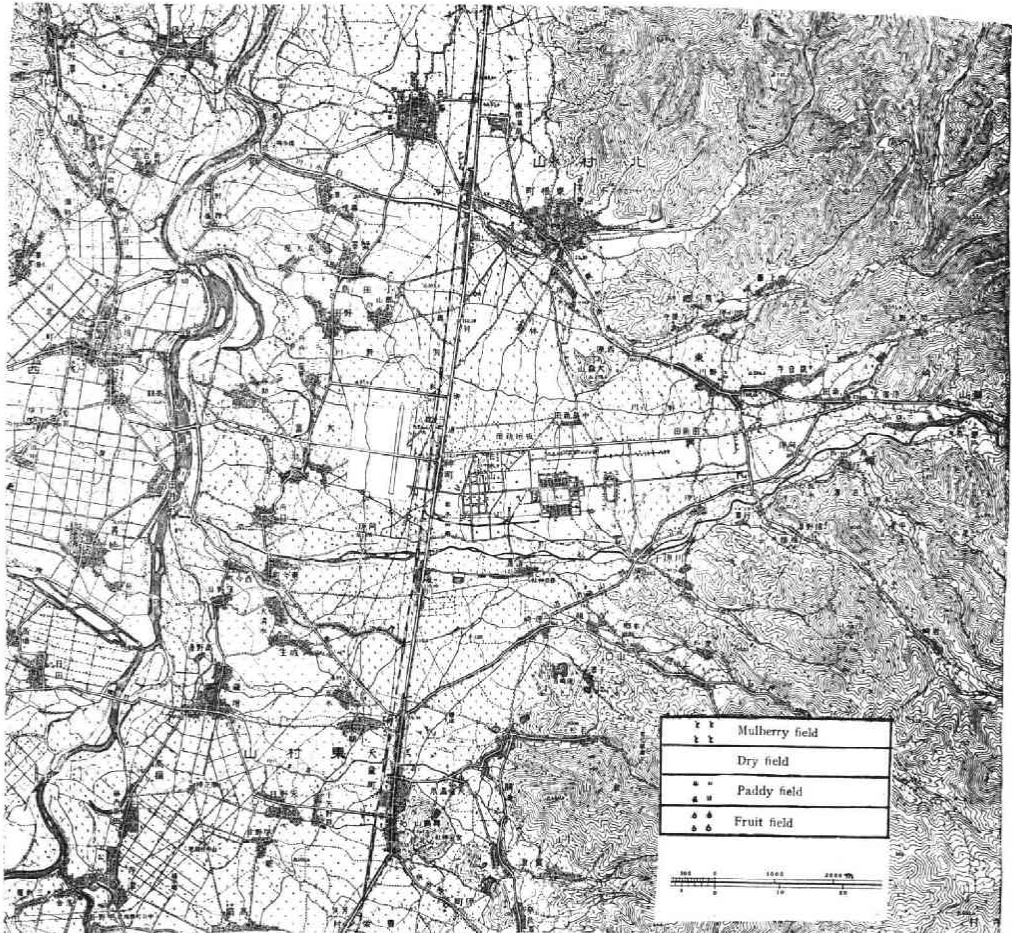


Fig. 2 Land use in 1933 (Provided that the military establishments are figured to modify in 1953).

fields.

The Yamagata basin is famous for the production of rice, and also sericulture has been prosperous since the feudal era. However, simultaneously with the decline of sericulture, fruit farming has been rapidly developed as a new alternative cash crop farming. The changing tendency of the agricultural land use in the Yamagata basin similar to that of the Yonezawa basin. Generally speaking, there are several reasons why the commercial farming besides rice raising has been developed in the basins in the Tohoku districts. The climate of the basins is suitable for fruit culture, and the spacious fans and natural levees developed in the tectonic basins are difficult to be used as paddy field on account of the in-

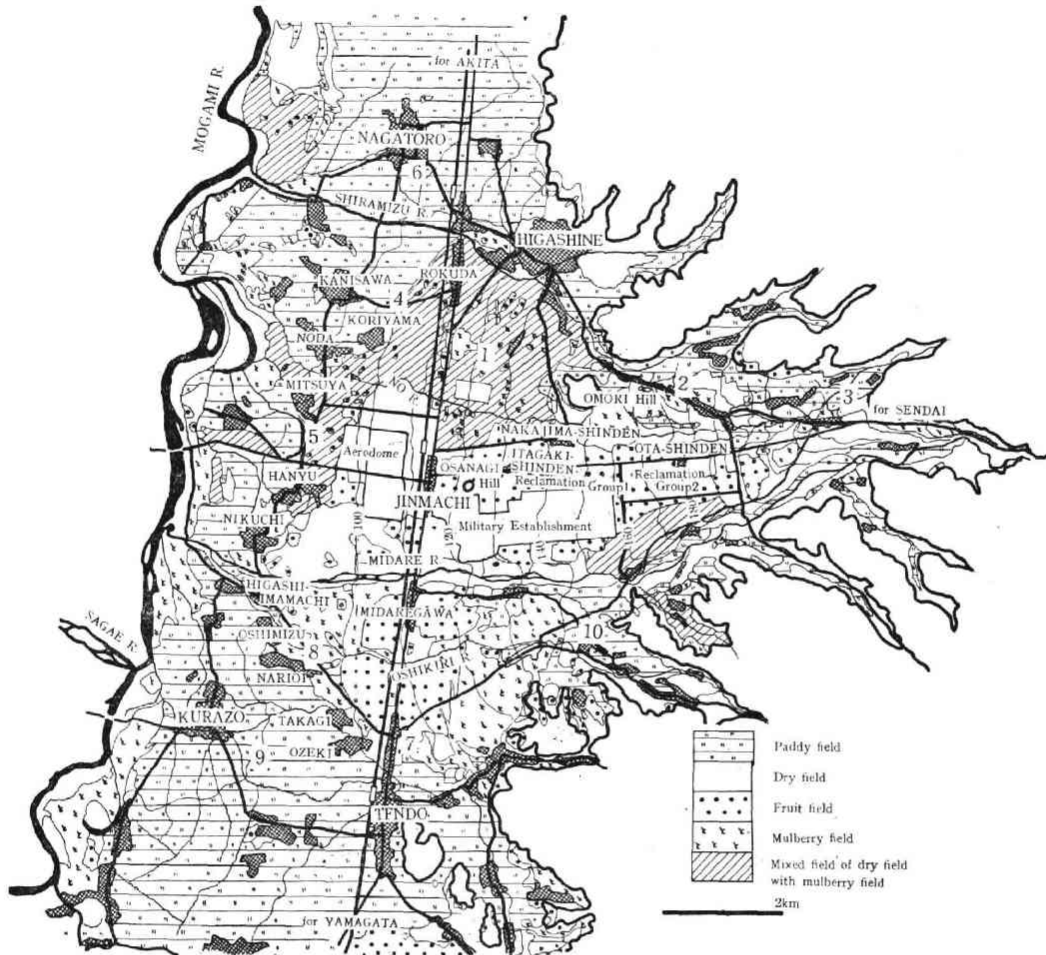


Fig. 3 Land use in 1959.

convenience of irrigation, and they have remained as grass land or mulberry field. Thus fruit growing has developed here as a major land use in accordance to the development of cash crop farming in Japan.

In this report, the author attempts to describe the land use on the Midare fan as a case of newly reclaimed fan, with a special emphasis on the development of apple culture.

2. Development of Land Use on the Midare Fan

The Midare fan is a composite fan formed by many rivers such as Midare, No, Shiramizu and Oshikiri. The relative height of the apex from the foot of the fan

is 180 meters. Humus soils are extensively distributed on the surface, and they are rather poor soils for agriculture. Along the spring belt on the edge of the fan, there are many settlements arranged on the semi-circumference: those are Takagi, Narioi, Oshimizu, Higashi-imamachi, Nikuchi, Hanyu, Mitsuya, Noda, Kanisawa etc. At Nikuchi and Hanyu trout are raised using the rich spring water. These settlements have their origin more than 300 years ago, and the villagers have cultivated the paddy fields in the outskirts of the fan besides the dry fields on the fan distributed eastward from their settlements.

Since the Ushyu highway leading to Akita was opened in feudal era through the middle part of the fan, the settlements such as Jinmachi, Midaregawa and Rokuda have developed along the road, and immigrants reclaimed waste land. Since about 1870 the reclamation of the waste land on the eastern side of the road was commenced, and new settlements were opened. These are Kobayashi-shinden, Itagaki-shinden, Ota-shinden and Nakajima-shinden. Owing to lack of irrigation water, it was very difficult to use the land as paddy fields, and the farmers cultured barley, wheat, soy bean, mulberry and tobacco. At the northeastern part of the fan, tobacco is still an important cash crop, whereas at Nakajima-shinden and Itagaki-shinden the majority of dry fields have been converted to apple yards. On the western side of the national road, new settlements have been also formed and the culture of mulberry, grape, apple and cherry has been managed. Especially the recent increase of apple growing is remarkable.

Table 1 Acreage of arable land (1956)

	Paddy field	Dry field	Orchard and mulberry field	Fruit field	Mulberry field
1. Higashine	930	1,510	490		
2. Togo	480	797	171		
3. Takasaki	257	403	69		
4. Odajima	671	636	305		
5. Otomi	551	482	156		
6. Nagatoro	1,000	239	318		
7. Tendo	355	230	68	29	39
8. Narioi	653	500	306	132	174
9. Kurazo	1515	256	164	5	159
10. Yamaguchi	500	936	560	237	323

Though it is only 3.3 percent to the total acreage of the nation, the apple fields in Yamagata Prefecture are 3,800 acres in total, of which the Yamagata basin occupies 64 percent. The core area of apple culture in the Yamagata basin is the northern half of the middle part of the Midare fan in which Jinmachi, Itagaki-shinden, Nakajima-shinden and the newly reclaimed area in the last 25 years are contained.

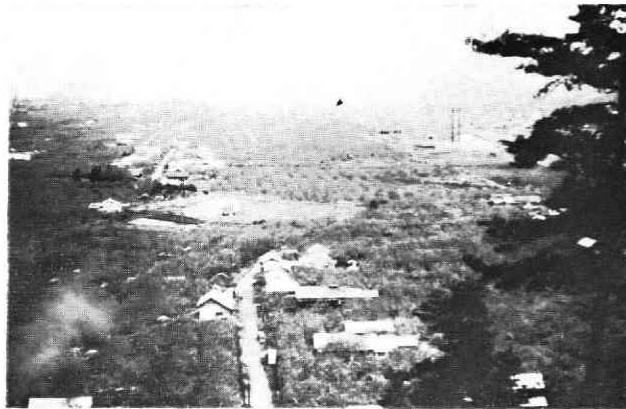
3. Apple Culture in the Midare Fan

The introduction of the apple culture in the Yamagata basin goes back to 1875, and the original area was Itagaki-shinden. According to an information dated 1893, there were 500 western fruit trees at Itagaki-shinden, including apple, cherry and grape. However apple culture was soon declined owing to the damages of diseases and insects. In 1898 apple growing was succeeded for the first time, then fruit growing has been gradually increased. In 1914 farmers organized a fruit cooperative association, yet the members of the association were very few and the acreage of their fields was very small. In 1900' the tobacco growing which characterized the land use on the Midare fan covered a large portion of dry-fields, but in 1920' the tobacco culture began to decrease, and now the area is reduced to the northeastern part of the fan, Takasaki and Togo areas, where the tobacco of good quality is produced. On the other hand, the fields of miscellaneous cereals which were the universal land use since the early stage of reclamation were changed to mulberry fields, keeping pace with the development of Japanese sericulture. In the middle part of the fan, such as Jinmachi, Itagaki-shinden and Nakajima-shinden, sericulture was very important, and fruit culture was still in the experimental stage. The depression of cocoon price in 1930' gave impetus to the increase of fruit growing, but even that did not bring such a radical change in the area, as seen in the Yonezawa basin.

It was the prefectural agricultural reclamation group at Osanagi that gave a strong incitement to fruit growing. After the plan of Prefectural Authorities, 55 pioneers began to reclaim the waste land of the middle part of the Midare fan in 1937. 7.4 acres of waste land were apportioned to each farmer. And the authorities distributed the young plants, for 2 acres of apple orchards and 0.5 acre of cherry orchard. In the process of reclamation, the creation of paddy fields which was a part of the plan failed owing to lack of irrigation water. Whereas fruit growing has been developed with successful results. After then, in the neighbouring areas such as Jinmachi, Itagaki-shinden and Nakajima-shinden, the farmers followed suit and vied with one another in the introduction of apple culture. At present these areas have developed into so intensive apple growing areas that 80 percent of arable land is fruit fields, of which 70 percent is planted to apples. However, the reclamation group was dispossessed of its farm land of 2 acres per farmer by Japanese Army for the purpose of establishing aerodrome, and moreover after the World War II 2 acres of the farm land were confiscated in order to set up the camp of U.S. Army. Thus, their arable land decreased from 7.3 acres to 3.4 acres per farmer. Besides, their houses and 30-50 percent of the apple yards were forced to move to the southeastern side of the Osanagi Hill.



1. Midare Fan viewed from the Osanagi Hill in the direction of Tendo.



2. Apple yards of reclamation group. Viewed from the Osanagi Hill. Right is the Camp of Self Defence Army.



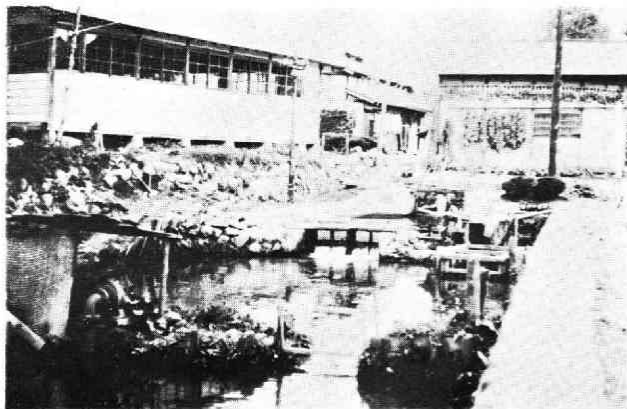
3. The Midare River in the middle part of the Midare fan.



4. Low grade house of a farmer, whose farm was compelled to move because of the army.



5. Farm house which was not affected by military institution.



6. Trout culture at Hanyu.

After the expatriation of U.S. Army, a part of the land was returned to farmers in 1956. However, former apple yard changes to shrubby land which must be reopened for cultivation, and the remaining foundation-stone of houses and the refuse of burnt coal were to be taken away, and these made the use of the land very difficult. Nowadays the soldiers of the Self-Defence-Army give farmers trouble that they trample down the vegetables cultured as companion crop. Thus the apple groweres have been influenced cruelly by military institutions, and it is said that they are 8 years behind undisturbed farmers in the improvements of managements. From the outlook of their houses, one can tell the difference between them.

Apple growers manage 3 acres of their apple yards and culture root vegetables and greens as companion crops in the yards.

In 1943 another reclamation group with 55 farmers began to reclaim the land on the eastern side of the former group's settlement. This group was also dispossessed of its farm land and a farmer's share decreased to 2.4 acres from 9.5 acres. Consequently the farmers have similar distresses to the former. In this area 120 acres of apple yards and 70 acres of miscellaneous cereal-fields are managed.

As mentioned above, the formation of apple yards in the middle part of the Midare fan has progressed by the reclamation of national waste land since 1930', and the farmers of the neighbouring settlements have followed in the footsteps of precedent.

In spite of the new reclamation and the undesirable influences of military institutions, it is advantageous to the apple culture in the Midare fan that the extent of apple yards per farmer is tow fold or three fold as large as that of other apple growing regions. Here, the tendency to become rich is more noticeable, and cultural operation is more mechanized than in other regions. This is, indeed, a special case of farming in recently reclaimed area.

At Jinmachi the Fruit Cooperative Association with 344 members and 680

Table 2 Number of agricultural tools (1956)

	Plough	Cultivator	Powered thrasher	Powered rice husk remover	Powered sprayer	Electric motor	Oil engine
1. Higashine	15	115	174	60	118	90	170
2. Togo	1	56	49	28	—	18	35
3. Takasaki	2	4	33	18	—	6	25
4. Odajima	6	169	82	26	—	61	29
5. Otomi	1	33	49	23	2	34	36
6. Nagatoro	—	8	151	37	1	98	58
7. Tendo	15	15	35	16	7	30	16
8. Narioi	28	26	30	10	50	53	32
9. Kurazo	32	3	244	59	5	242	13
10. Yamaguchi	48	130	89	19	97	46	89

acres of apple yards plays an active part as a thrust-shaft of apple culture. It transacts the cooperative shipment with 1,950 ton of apples. Apple growers carry on the works of selection, grading and shipment of apples as well as the work of spraying on cooperative basis. For the sprinkling of agricultural medicine, speed-sprayers are used, which are so effective that the operation for 2 acres of land takes 22 minutes and the volume of the medicine is enough to do with only one-third of the case of powered sprayer. Moreover it is favourably commented upon the saving of labour and the solution of the difficulty of obtaining water. It was possible to introduce speed-sprayers without trouble, because in these areas being newly reclaimed land, agricultural roads in the farms were organized well, apple yards are concentrated in an area, and each lot of the yard is larger than in such apple producing regions as the Iwaki and the Yokote basins. The apple culture in the area enters the stage of the cooperation of cultural technique such as pruning, by which the apple growers intend to reduce production cost and to improve and standardize the quality of products. On these bases they expect to compete with the monopolistic Iwaki basin and Nagano Prefecture, seeking for the stable market.

4. New Change of Land Use of the Midare Fan

There is a trend to convert mulberry fields into apple yards around the kernel area of apple growing. Essentially the land use or agricultural management systems in each part of the fan are as follows: In the lower part of the fan, paddy field and trout culture are managed at Otomi, and paddy field and sericulture at Odajima and Nagatoro; in the area from apex to the middle part of the northern half of the fan, tobacco, miscellaneous cereals and charcoal making are main source of farmer's livelihood; and in the southern part of the fan farming is specialized in sericulture there. However, the land use in the lower part of the fan is changing from mulberry field to apple field. In 1958, it was enforced to

Table 3. Number of farmers classified by farm income
(Higashine City) (1956)

1. self sufficient	715	2)—10): They mean the farmer gained more than 40% of their income by selling each crop.
2. rice	1,525	
3. wheat and barley	196	7): It contains the income from tobacco growing.
4. miscellaneous cereals	32	
5. potato and sweet potato	3	
6. vegetables	3	
7. industrial crops	1,078	
8. fruit	340	
9. sericulture	148	
10. livestock	5	
11. others	124	

reduce the acreage of mulberry fields by 20 percent, according to a national agricultural policy, and the farmers were obliged to convert the land to fruit field or vegetable field. At Odajima the farmers are beginning to raise peach, asparagus and other vegetables for the purpose of supplying to a newly established food processing plant. In the part to the south of the Midare River, mulberry fields are also changing to apple fields, but the dominant land use is still mulberry. However, judging from newly planted young trees in the fields, the yards of apple, peach and grape will become increasingly popular replacing mulberry, and in near future the Midare fan will develop to a large fruit producing area.

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